

REMARKS

Claims 1-20, 22-33, and 35 remain pending in this application.

Claims 1-2, 5-9, 11-12, 14-16, 18-20, 24, 26-27, 29-31, and 33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Robertson et al., U.S. Patent No. 6,658,530 (“Robertson”) in view of Alleged Admitted Prior Art (“AAPA”). The rejection is respectfully traversed.

Claim 1 recites a circuit card with “a circuit element supported by the circuit card.” The circuit element has “a plurality of inputs and outputs,” and “a plurality of signal lines supported by the circuit card.” Each signal line is “electrically connected respectively to one of said plurality of inputs or one of said plurality of outputs.” A “plurality of shields [is] supported by the circuit card.” The signal lines are “grouped in a plurality of adjacent corresponding pairs.” A shield is “located respectively on each side of each of said plurality of corresponding pairs of said signal lines.”

Robertson discloses a memory module. The memory module includes printed circuit board (PCB) 101 and a connector 102. The PCB 101 features signal traces 103 that are arranged to be as short as possible. The PCB 101 includes a power layer, an electrical ground layer, and a plurality of signal layers. Robertson does not teach or suggest a circuit card with “a plurality of shields supported by the circuit card” where “a plurality of signal lines supported by the circuit card” are “grouped in a plurality of adjacent corresponding pairs” and a shield is “located respectively on each side of each of said plurality of corresponding pairs of said signal lines.”

Instead, Robertson teaches a grounding arrangement that involves ground pins 106 that are part of the *connector* 102. Robertson is silent regarding “shields

supported by the circuit card,” PCB 101. Consequently, Robertson teaches nothing about shields “located respectively on each side of each of [a] plurality of corresponding pairs of [circuit element] signal lines” supported on the circuit card.

The Office Action recognizes that Robertson does not “disclose shields that extend the entire length of the signal to the circuit card and supported by the circuit card.” Office Action at 2-3. The Office Action relies on the AAPA to remedy this deficiency. Applicant respectfully submits that, absent hindsight of the claimed invention, one of ordinary skill in the art, following the teachings of Robertson, would not be motivated to follow the teachings of the AAPA to add shields that extend the entire length of the signal to the circuit cards, but would instead be motivated by Robertson to eliminate the shields of AAPA and simply provide ground connector pins, as Robertson teaches, to eliminate cross talk. In effect, Robertson teaches away from the claimed invention by his teaching that simply adding ground pins between groups of signal pins, will eliminate cross talk. Robertson teaches to eliminate the shields of AAPA because the properties of the ground pins 106 and the shields of the AAPA vary. For instance, the ground pin 106 is connected to an electrical ground layer (col. 4, line 21) of PCB 101. Also, the pin 106 is located as part of the *connector* 102, and not “supported by the circuit card” as in the claimed invention. Further, the ground pin 106 provides a “low resistance path for return currents from the memory module.” (col. 3, lines 60-64). The claimed invention, on the other hand, teaches that the shields provide a coupling path from the signal lines to ground (except for between the corresponding pairs of signal lines). (¶ 0024). Robertson’s signal traces are not shielded at all, and Robertson does not suggest that they should be or need be shielded to eliminate cross talk. The properties of Robertson and AAPA vary and thus cannot be combined to teach, disclose, or suggest the claimed invention. Accordingly, Applicant

submits that the claimed invention would not have been obvious to one of ordinary skill in the art.

Furthermore, Robertson fails to teach or suggest how to modify AAPA to obtain the claimed invention. There is therefore no *prima facie* case of obviousness.

Obviousness is based on factual findings. "Whether a patent claim is obvious under section 103 depends upon the answer to several factual questions and how the factual answers meld into the legal conclusion of obviousness *vel non*." *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351 (Fed. Cir. 2001). The four underlying factual inquiries are: (1) the scope and content of the prior art; (2) the differences between the claims and the prior art; (3) the level of ordinary skill in the pertinent art; and (4) secondary considerations, if any, of non-obviousness. *Graham v. John Deere Co.*, 393 U.S. 1, 17-18 (1966).

Applicant respectfully submits that there is no motivation to combine the cited references to obtain the invention of claims 1, 6, 8, 11, 15, 18, 19, 26, 30, and 33.

Motivation or suggestion to combine or modify prior art references "must be clear and particular, and it must be supported by actual evidence." *Teleflex, Inc. v. Ficosa North America Corp.*, 299 F.3d 1313, 1334 (Fed. Cir. 2002). Because the "genius of invention is often a combination of known elements which in hindsight seems preordained," the Federal Circuit requires a "rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references." *McGinley*, 262, F.3d at 1351. Yet there is no teaching or suggestion within any of the references that provide a motivation to combine them.

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). Thus, a showing of an obvious

combination requires more than just an amalgam of references, each of which provides one feature of the claimed invention.

The Office Action has done no more than cite a pair of references, each of which allegedly provides only part of the claimed invention, and allege that their combination renders the invention obvious. However, without the benefit of hindsight, there would have been no motivation to combine these references and the Office Action has failed to provide proof of any such motivation. This is one more reason why claims 1, 6, 8, 11, 15, 18, 19, 26, 30, and 33 are allowable over the cited combination.

The Office Action states that there is motivation to combine AAPA and Robertson because “one of ordinary skill in the art would recognize the benefit of having the entire length of signal lines shielded to reduce cross-talk along the entire signal lines compared to just reduce cross-talk at the pins.” Office Action at 10-11. However, as discussed above, there is no motivation to combine because Robertson teaches to eliminate the shields of AAPA by teaching the use of ground pins 106. The properties of ground pins 106 are different from the shields disclosed in AAPA. Accordingly, Applicant submits that the claimed invention would not have been obvious to one of ordinary skill in the art.

Claims 2 and 5 depend from claim 1 and are patentable for at least the same reasons.

Claim 6 recites, *inter alia*, a circuit card with “a plurality of shields supported by said circuit card.” The shields are “arranged and configured on said printed circuit board to be electrically connected at a first end to respective connectors of said connector device.” Each shield is “electrically connected at a second end to a respective one of said plurality of circuit element inputs or outputs.” The signal lines are

"grouped in a plurality of adjacent corresponding pairs," and "respective ones of said shields being located respectively on each side of each of said plurality of corresponding pairs of said signal lines."

As noted above in connection with claim 1, Robertson and the AAPA teach different ways to eliminate cross talk between signals. Robertson does not teach or suggest a "plurality of shields supported by said circuit card." Robertson does not teach "signal lines being grouped in a plurality of adjacent corresponding pairs, respective ones of said shields being located on each side of each of said plurality of corresponding pairs of said signal lines." Further, as noted above, Robertson in effect teaches away from the claimed invention by simply adding grounded connector pins, not shields, to eliminate cross talk.

Claim 7 depends from claim 6 and is patentable for at least the same reasons.

Claim 8 recites, in pertinent part, a circuit card having "a shield on the circuit card extending adjacent and the length of each respective signal line pair," which are "on the circuit card." As noted above in connection with claim 1, the combination of Robertson and the AAPA fails to teach the claimed invention. Moreover, the combination would not motivate one of ordinary skill to arrive at the claimed invention, but rather would motivate one of ordinary skill to eliminate the shields of AAPA, an important feature of the claimed invention. Claim 8 and its dependent claim 9 are patentable for at least the same reasons.

Claim 11 recites a memory expansion card with a memory device. The memory expansion card includes, *inter alia*, "a plurality of shields on the expansion card and electrically connected to said memory device, a shield being located

respectively between each pair of [a] plurality of corresponding pairs of [memory device] signal lines."

As noted above in connection with claim 1, the combination of Robertson and the AAPA fails to teach the claimed invention. Moreover, the combination would not motivate one of ordinary skill to arrive at the claimed invention, but rather would motivate one of ordinary skill to eliminate the shields of AAPA, an important feature of the claimed invention. Claim 11 and its dependent claims 12 and 14 are patentable for at least the same reasons.

Claim 15 recites a memory expansion card that includes "a plurality of shields supported by said expansion card and electrically connected to [a] memory device." Respective shields are "located to extend along and between each of [a] plurality of corresponding pairs of...signal lines."

As noted above in connection with claim 1, the combination of Robertson and the AAPA fails to teach the claimed invention. Moreover, the combination would not motivate one of ordinary skill to arrive at the claimed invention, but rather would motivate one of ordinary skill to eliminate the shields of AAPA, an important feature of the claimed invention. Claim 15 and dependent claim 16 are patentable for at least the same reasons.

Claim 18 recites a memory expansion card assembly that includes, *inter alia*, "a connector device mounted on a motherboard and having a plurality of connectors, said plurality of connectors having a first portion for conducting signals and a second portion for providing a shield, said connectors in said first portion being grouped in a plurality of corresponding pairs, a respective one of said connectors in said second portion being located between each of said plurality of corresponding pairs of said first

portion of said plurality of connectors," "a plurality of signal lines on said expansion card being connected respectively to each of said first portion of connectors," and "a plurality of shields on said expansion card being connected respectively to each of said connectors in said second portion and extending respectively along adjacent signal lines connected to said first portion of connectors."

As noted above in connection with claim 1, the combination of Robertson and the AAPA fails to teach the claimed invention. Moreover, the combination would not motivate one of ordinary skill to arrive at the claimed invention, but rather would motivate one of ordinary skill to eliminate the shields of AAPA, an important feature of the claimed invention.

Claim 19 recites a processing system that includes, *inter alia*, "a plurality of shields supported by [a] circuit card, each shield being connected respectively to [a] circuit element, [and] signal lines being grouped in a plurality of adjacent corresponding pairs, a shield being located between respective corresponding pairs of said signal lines."

As noted above in connection with claim 1, the combination of Robertson and the AAPA fails to teach the claimed invention. Moreover, the combination would not motivate one of ordinary skill to arrive at the claimed invention, but rather would motivate one of ordinary skill to eliminate the shields of AAPA, an important feature of the claimed invention. Claim 19 and dependent claims 20 and 24 are patentable for at least the same reasons.

Claim 26 recites a processing system that includes a memory expansion card with "a plurality of signal lines and a plurality of shields supported by said memory expansion card." Each of a first portion of said plurality of inputs and outputs of said memory device is "coupled to a respective signal line to receive signals from or send

signals to respective ones of said connectors of said connector device.” The signal lines are “grouped in a plurality of corresponding pairs.” A shield is “located on each respective side of each of said plurality of corresponding pairs of said signal lines.”

As noted above in connection with claim 1, the combination of Robertson and the AAPA fails to teach the claimed invention. Moreover, the combination would not motivate one of ordinary skill to arrive at the claimed invention, but rather would motivate one of ordinary skill to eliminate the shields of AAPA, an important feature of the claimed invention. Claim 26 and dependent claims 27 and 29 are patentable for at least the same reasons.

Claim 30 recites a processing system in which a memory expansion card a memory expansion card and “a plurality of shields supported by said expansion card and electrically connected to said memory device.” A “respective one of said plurality of shields” is “located to extend along each of said plurality of corresponding pairs of [a] plurality of signal lines.”

As noted above in connection with claim 1, the combination of Robertson and the AAPA fails to teach the claimed invention. Moreover, the combination would not motivate one of ordinary skill to arrive at the claimed invention, but rather would motivate one of ordinary skill to eliminate the shields of AAPA, an important feature of the claimed invention. Claim 30 and dependent claim 31 are patentable for at least the same reasons.

Claim 33 recites a “method for constructing on a circuit card a bus system device.” The method includes steps of “providing a circuit element on said circuit card.” The circuit element has “a first plurality of connectors for conducting bus signals” grouped “into a plurality of corresponding pairs.” A second plurality of

connectors provided on the circuit element is “connected to a respective shield supported on said circuit card.” A respective shield extends “along each side of respective pairs of signal lines supported on said circuit card” and “connected to each of said corresponding pairs of said first plurality of connectors.”

As noted above in connection with claim 1, the combination of Robertson and the AAPA would not motivate one of ordinary skill to arrive at the claimed invention, but rather would motivate one of ordinary skill to eliminate the shields of AAPA, an important feature of the claimed invention. Applicant respectfully requests the withdrawal of the rejection and the allowance of the claims.

Claims 3 and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Robertson in view of the AAPA and further in view of Chin et al., U.S. Patent No. 6,216,205 (“Chin”). This rejection is respectfully traversed.

Claim 3 depends from claim 1, and claim 22 depends from claim 19. Claims 1 and 19 are submitted to be patentable over Robertson and the AAPA for the reasons advanced above. Chin does not remedy the deficiencies of Robertson and the AAPA. Chin has been cited as providing a driver to drive signals between inputs and outputs of the circuit element. However, Chin does not address the deficiency of the Examiner’s proposed combination of Robertson and the AAPA – that is, Chin does not teach a circuit card with “a plurality of shields supported by the circuit card” where a plurality of signal lines supported by the circuit card” are “grouped in plurality of adjacent corresponding pairs” and a shield is “located respectively on each side of each of said plurality of corresponding pairs of said signal lines.”

Withdrawal of the rejection and allowance of the claims is respectfully requested.

Claims 4, 10, 13, 17, 23, 28, 32, and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Robertson and AAPA in view of Ortega et al., U.S. Patent No. 6,257,587 ("Ortega"). This rejection is respectfully traversed.

Claims 4, 10, 13, 17, 23, 28, and 35 depend from claims 1, 8, 11, 15, 19, 26, 30, and 35, respectively. Claims 1, 8, 11, 15, 19, 26, 30, and 35 are patentable over Robertson and the AAPA for the reasons advanced above. Ortega does not remedy the deficiencies of Robertson and the AAPA noted above. Accordingly, claims 4, 10, 13, 17, 23, 28, and 35 are submitted to be patentable for the reasons discussed above with respect to claims 1, 8, 11, 15, 19, 26, 30, and 35. Withdrawal of the rejection and allowance of the claims is respectfully requested.

Claim 25 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Robertson in view of the AAPA and further in view of Elabd, U.S. Patent No. 6,526,462 ("Elabd"). This rejection is respectfully traversed.

Claim 25 depends directly from claim 19. Claim 19 is patentable over Robertson and the AAPA. Elabd does not remedy the deficiencies of Robertson and the AAPA which are discussed above. Accordingly, claim 25 is submitted to be patentable over Robertson and the AAPA in view of Elabd for the reasons discussed above with respect to claim 19. Withdrawal of this rejection and allowance of the claims is respectfully requested.

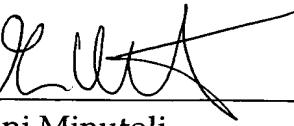
In view of the foregoing amendment, Applicant submits that the claimed application is in condition for allowance, and such action is earnestly solicited.

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